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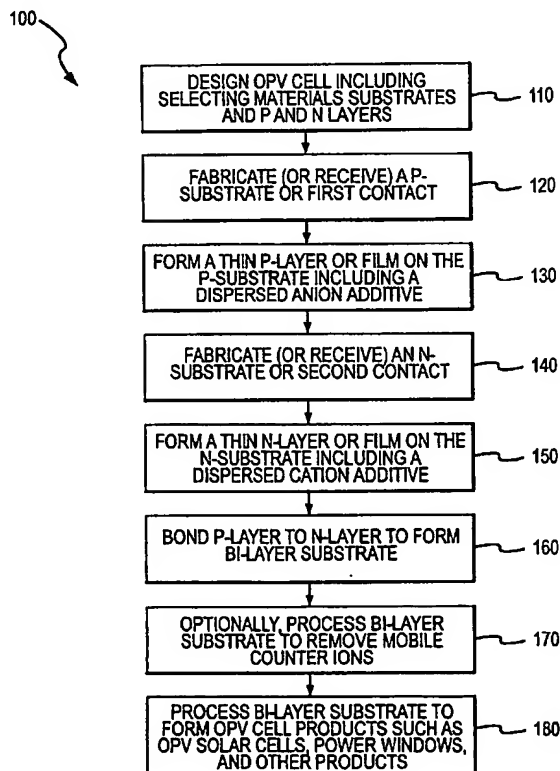
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(54) Title: ORGANIC PHOTOVOLTAIC CELLS WITH AN ELECTRIC FIELD INTEGRALLY-FORMED AT THE HETEROJUNCTION INTERFACE



(57) Abstract: A bi-layer photovoltaic cell, and method (100) of making same, with an electric field applied at the p-n heterojunction interface. The cell includes a first semiconductor layer including a binder, nanocrystals of an n-type semiconductor, and spatially bound cations and a second semiconductor layer contacting the first semiconductor layer that includes a binder, nanocrystals of a p-type semiconductor, and spatially bound anions. The cell further includes a p-n heterojunction at the contacting interface between the first and second semiconductor layers. An electric field is created by the spatially bound cations and anions that are located in the layers proximal to the p-n heterojunction. The nanocrystals are single crystals of organic semiconductors that are less than 50 nanometers in size and that comprise a majority of the volume of their respective layers. The binder is a polymer matrix, such as an epoxy. The cell includes electrical contacts abutting the semiconductor layers.

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